

Estimation and Prediction of Unmanned Aerial Vehicle Trajectories, Phase II

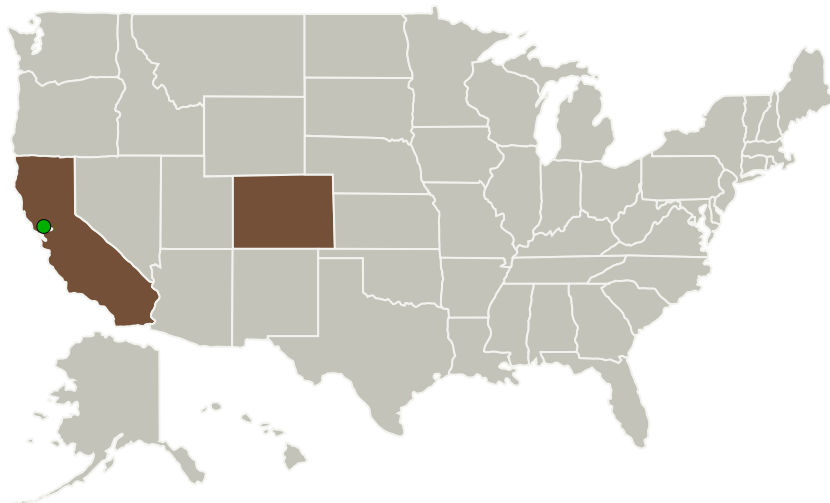
Completed Technology Project (2011 - 2013)



Project Introduction

There is serious concern about the introduction of Unmanned Aerial Vehicles (UAV) in the National Air Space (NAS) because of their potential to increase the risk of collision between aircraft. At present, many UAV platforms lack a Sense and Avoid (SAA) capability to mitigate collision risk, and this has prevented both the government and private contractors from using these platforms in critically needed reconnaissance, surveillance, and security enforcement missions. To demonstrate a SAA capability that is applicable to a wide range of UAV platforms, advanced trajectory estimation and prediction algorithms are developed and used to exploit a small collision avoidance radar currently under development for UAV operation. Collision prediction algorithms will assess potential risk in probabilistic terms using adaptive techniques that permit accurate predictions across long time horizons. Techniques to ensure these predictions are robust to modeling uncertainty increase the utility the developed SAA capability for realistic scenarios.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Numerica Corporation	Lead Organization	Industry	Fort Collins, Colorado
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California



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Primary U.S. Work Locations

California

Colorado

Project Transitions

 **June 2011:** Project Start

 **May 2013:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138844>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Numerica Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

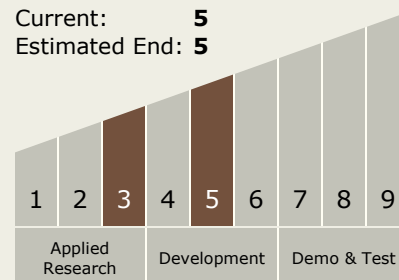
Carlos Torrez

Principal Investigator:

Jason Adaska

Technology Maturity (TRL)

Start: 3
Current: 5
Estimated End: 5



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Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.2 Flight Mechanics
 - └ TX15.2.1 Trajectory Design and Analysis

Target Destinations

The Sun, Earth, The Moon,
Mars, Others Inside the Solar
System, Outside the Solar
System